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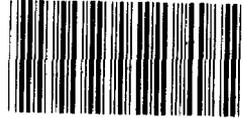
Report To The Congress

OF THE UNITED STATES

Changes Are Needed To Assure Accurate And Valid Wheat Deficiency Payments

The Department of Agriculture has paid wheat farmers millions of dollars to supplement their income because of low market prices. GAO found that some information and procedures used by the Department could cause overpayments or underpayments to farmers.

GAO recommends specific procedures to improve the accuracy of the Department's payments



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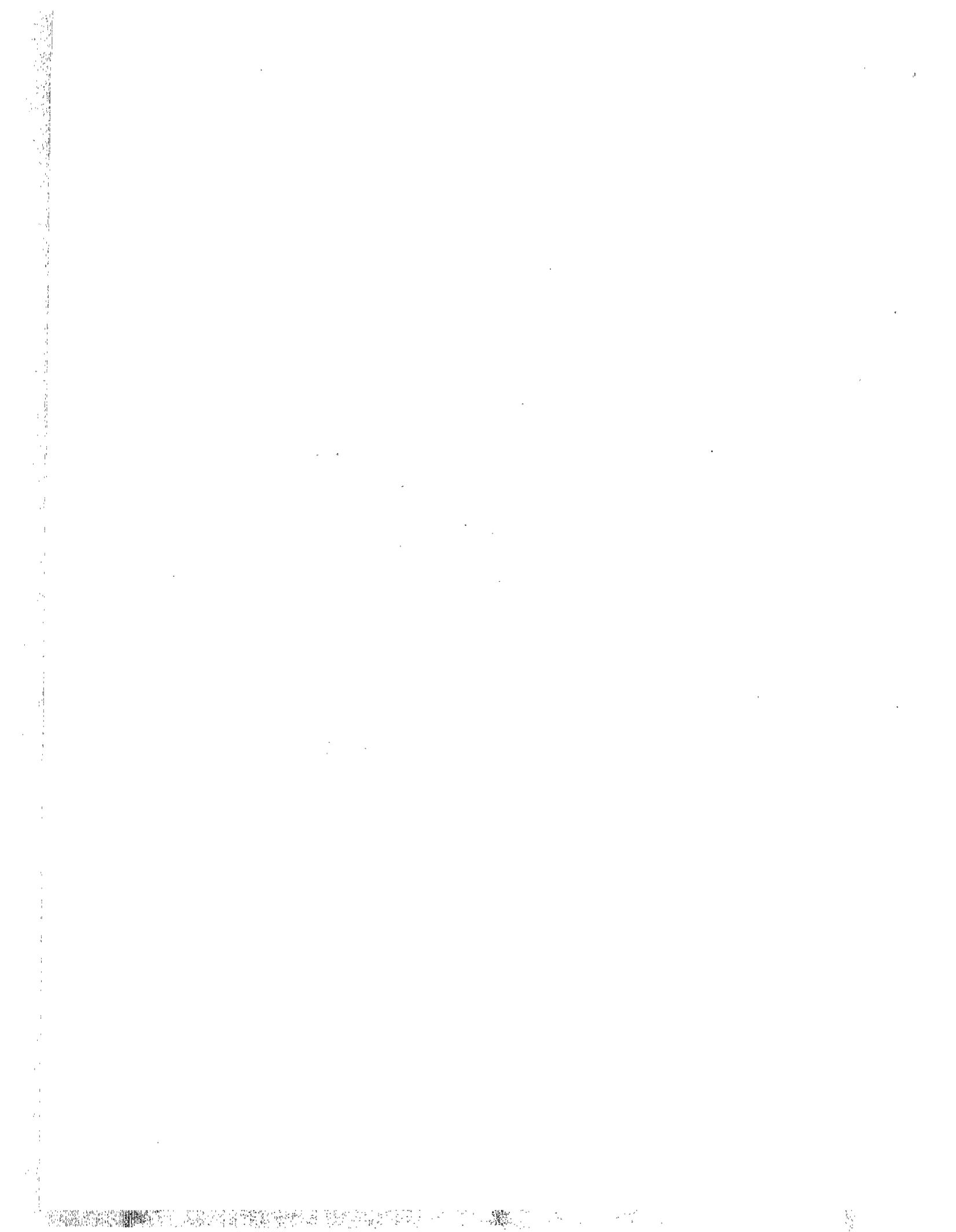
To the President of the Senate and the
Speaker of the House of Representatives

This report discusses problems found in the information and procedures used to make deficiency payments to wheat farmers and makes recommendations to the Secretary of Agriculture to improve the accuracy and validity of payments made.

We reviewed the Department of Agriculture's system for making wheat deficiency payments because about 55 percent of the approximately \$3.6 billion disbursed for all crops between 1974, when the program started, and 1981 was paid to wheat farmers. About \$414 million more was paid to wheat farmers in 1982.

We are sending copies of this report to the Director, Office of Management and Budget, and the Secretary of Agriculture.

Charles A. Bowsher
Comptroller General
of the United States



D I G E S T

Farmers participating in the wheat crop program receive deficiency payments from the Department of Agriculture based on the difference between a target price and the lower national average market price of wheat. These payments, authorized by the Agriculture and Consumer Protection Act of 1973, are designed to supplement eligible wheat farmers' incomes in the years when wheat prices are low. Changes are necessary to assure that accurate and valid payments are being made.

GAO identified a number of factors that could cause overpayments or underpayments to farmers.

- Inaccurate data is used in establishing the national average market price.
- Procedures used to determine production for the purpose of computing program payment amounts overstate farmers' actual production.
- The method of calculating yields for farmers submitting evidence of actual production is not precise.

Wheat deficiency payments totaled \$2 billion from 1974, when the program began, through 1981 and accounted for about 55 percent of such payments for all crops. For the 1982 crop year, additional wheat payments of \$474 million are expected.

GAO examined the Department of Agriculture's system for making wheat deficiency payments to determine if the national average market price was valid and if the information used to calculate the amount paid farmers was accurate. Procedural problems were found. Where GAO had indications that the problems existed nationwide, it estimated the range of deficiency overpayments and underpayments that may have resulted. Statistical sampling methods were not used to make projections. Instead, the ranges of possible overpayments or underpayments were estimated on the basis of various stated assumptions.

DETERMINING THE NATIONAL
AVERAGE MARKET PRICE

The validity of the Department's national average market price is questionable because estimates and inaccurate price data are used to derive it. Establishing a valid market price is extremely important. For example, a 1-cent change in the price would have made a difference of \$28 million in the amount paid in 1981. GAO identified a number of practices the Department should adopt to obtain an accurate and valid market price that will reduce the possibility of overpayments and underpayments to farmers. For example, the Department should institute a quality measurement system for the survey it uses to collect price data. (See p. 4.)

According to the Statistical Reporting Service's (SRS') Director, Estimates Division, and Chief, Prices and Labor Branch, SRS does not have a quality measurement system because the information is provided voluntarily and is accepted unless obvious errors exist.

DETERMINING PROGRAM YIELDS

A farmer's deficiency payment is determined as follows.

Program yield x planted acres x payment
rate = deficiency payment.

The program yield is the number of bushels per acre each farm is determined capable of producing by the Department's Agricultural Stabilization and Conservation Service (ASCS). It is based on SRS' prior years' harvested yield data. This yield is multiplied by the farmer's current year's planted acres. This overstates production because it assumes that all planted acres will be harvested. All acres are not harvested because of flooding, freezing, drought, or other reasons. Overstated production results in deficiency overpayments. GAO estimates that deficiency overpayments of between \$15 million and \$43 million occurred for the 1981 wheat crop. GAO also estimates that in 1982 the overpayment will range from \$20 million to \$57 million. Unless the practice is corrected, overpayments will continue in future years. (See p. 14.)

GAO found, in addition, that the Department's process of assigning yields to individual farmers results in some further inequities. Farms with high yields are assigned program yields that are too low and farms with low yields are assigned program yields that are too high. An ASCS program specialist said that ASCS attempted to rectify the problem in 1980 but not enough was done. (See p. 16.)

CALCULATION OF PROVEN YIELDS

Farmers who want to prove higher yields than the Department assigned them can submit evidence of actual production for the previous 3 years. The Department establishes the farmers' proven yields by computing a simple average from each of the previous 3 years' average crop yields.

This "average-of-averages" method does not account for year-to-year changes in acreages and yields. The Department's method tends to overstate or understate yields, depending on whether acreages and yields increase and/or decrease each year.

GAO believes a weighted average method is more equitable in representing proven yields because it considers the changes in both acreage and yield that occur from year to year. GAO estimated that in the two counties visited, 12 percent of the amount paid to farmers for proven yield increases resulted in either an overpayment or underpayment to farmers. (See p. 24.)

ASCS agreed that when acreage and yield fluctuated from year to year, a simple average over a 3- or 5-year period resulted in overstatements and/or understatements of proven yields.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

GAO recommends that the Secretary direct the Administrator, SRS, to:

- Adopt specific procedures to improve the accuracy and validity of the national average market price. (See pp. 11 and 12.)
- Develop an acceptable adjustment for the deficiency payment program that properly accounts for unharvested acreage on which payments are made. (See p. 20.)

- Develop crop yield frequency distributions for counties or similar areas to assist ASCS county committees in assigning yields to individual farms. (See p. 21.)
- Compute proven yields using weighted averages to properly account for year-to-year changes in yield and acreage planted. (See p. 26.)

AGENCY COMMENTS AND
GAO EVALUATION

The Department stated that GAO's report is generally informative and points out several areas in which procedures need further refinement. (See app. I.) It will implement all of the specific procedures recommended to improve the accuracy and validity of the national average market price except one to institute a system of quality control for collecting market price data. It said that increasing the sample size would be a more prudent use of any additional funds. GAO disagrees. Collecting more invalid data would not increase the accuracy of the market price.

The Department did not take a specific position on the recommendation to develop an acceptable adjustment that properly accounts for the unharvested acreage on which deficiency payments are made. It also did not take a position on the recommendation to develop crop yield frequency distributions to assist county committees in assigning yields.

The Department did not agree with the recommendation to change the computation method for proven yields. It stated that the amount of differences in payment shown by GAO's review does not justify the extra administrative effort needed to compute and maintain proven yields using the weighted average formula.

GAO believes the Department should adopt the weighted average method because it treats all farmers equitably and is more precise. The same information ASCS has available to compute the average yield each year can be used to compute a weighted average. It is a simple calculation and should not involve any additional administrative effort.

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ABBREVIATIONS

ASCS	Agricultural Stabilization and Conservation Service
GAO	General Accounting Office
SRS	Statistical Reporting Service
USDA	U.S. Department of Agriculture

CHAPTER 1

INTRODUCTION

The Congress began authorizing price support programs in the 1930's to soften the impact of economic forces on farmers. These price support programs include crop loans, purchases of commodities, and direct payments to farmers. The programs are administered by the Department of Agriculture, mainly through its Agricultural Stabilization and Conservation Service (ASCS), and are financed through the Commodity Credit Corporation.

Deficiency payments are one type of direct payment to the farmers and are designed to supplement the farmers' income in years when prices are low and to persuade them to participate in acreage reduction programs. Deficiency payments were first authorized by the Agriculture and Consumer Protection Act of 1973 (Public Law 93-86).

Deficiency payments are made to farmers only in years when the national average market price received by farmers for a crop is less than the target price established by the Congress. The market price for wheat is the weighted average price received by farmers during the first 5 months of the crop's marketing year. The market price is determined from information on prices paid farmers and is reported by grain buyers in a prices received survey conducted by the Department's Statistical Reporting Service (SRS). The Congress establishes the target price after considering cost of production and crop yield changes.

Farmers must meet eligibility requirements before they can receive the deficiency payments. In some years they are required to reduce their crop acreage to be eligible. Farmers are also limited in the amount they may receive. In 1980 and 1981, the maximum deficiency payment that a person was entitled to, in combination with other crop programs, was \$50,000.

The amount of deficiency payment a farmer receives for wheat is based on a per bushel payment rate, which is the difference between the target price and the national average market price, or the difference between the target price and the nonrecourse loan rate (another price support program), whichever is smaller. The payment rate is then multiplied by the farmer's program production. For 1981, program production for wheat was determined by multiplying the farmer's certified acres planted in 1981 by the farmer's established program yield. Farmers who wish to be eligible for payment must certify their crop and program acres at their county ASCS office. ASCS establishes the program yield, which is determined to be the number of bushels per acre each farm is capable of producing.

The payment calculation and check issuance is usually performed by a computer system operated by the ASCS Kansas City Field Office. Planted acreage, program yields, and other information

needed to calculate the deficiency payment for each farm are provided by about 2,700 county ASCS offices located throughout the country.

Deficiency payments were made in 5 of the 8 years from 1974 through 1981 and amounted to about \$3,643 million for all crops. Deficiency payments for wheat were made in 1977, 1978, and 1981 and cost about \$2 billion, or about 55 percent of the total. About \$474 million in additional wheat payments will be paid in 1982. The 1977 wheat deficiency payments were paid at a rate of 65 cents a bushel, the 1978 rate was 52 cents, the 1981 rate was 15 cents, and the 1982 rate was 50 cents.

OBJECTIVES, SCOPE, AND METHODOLOGY

We examined the Department's system for making wheat deficiency payments to determine if the national average market price was accurate and if the information used in calculating the amount paid farmers was accurate. We selected wheat deficiency payments because they accounted for nearly 55 percent of all deficiency payments through 1980 and were again paid for the 1981 crop. Specifically, we reviewed the Department's systems for (1) determining the annual national average market price, which is one of the primary factors considered in the rate per bushel to be paid, (2) acquiring the information on farm production, which is needed to calculate the amount each farmer is paid, and (3) processing, calculating, and issuing payments to the farmers.

We conducted our review at the Department's headquarters in Washington, D.C. We obtained information from SRS' State statistical offices in Kansas, North Dakota, and Texas and also acquired information reported from 13 grain buyers in these States. We selected the three States because of their location along the Wheat Belt and because they are among the largest wheat-producing States among 20 participating in the prices received survey. The three States accounted for 31 percent of the total wheat production in 1980. Within these States we visited the counties that were among the largest wheat-producing counties. The grain buyers we selected to visit were identified by SRS State statisticians as buyers who had been selected to participate in their prices received survey.

We conducted our review also at the ASCS Kansas City Field Office in Kansas City, Missouri; the Kansas State ASCS office in Manhattan, Kansas; and ASCS county offices in Reno County, Kansas, and Cass County, North Dakota.

We made the review in accordance with generally accepted government auditing standards. Although we found problems with the data collected by SRS in its prices received survey, the survey design used in developing the average market price was acceptable.

We did not use statistical sampling methods in our analyses of the wheat deficiency program to make projections on the extent to which the problems existed nationwide. Instead, we estimated, on the basis of various stated assumptions, the range of deficiency overpayments and underpayments that may have resulted.

Our review of ASCS' program yield computations was limited to ASCS' use of SRS-reported data. We did not review SRS' methodologies used in reporting planted and harvested yields.

CHAPTER 2

THE ACCURACY OF THE AVERAGE MARKET

PRICE IS QUESTIONABLE

The accuracy of the national average market price determined from SRS' prices received survey is questionable because

- SRS accepted and used average price data, which can be erroneous, rather than data on actual dollars paid;
- grain buyers provided inaccurate data; and
- a large proportion of grain buyers did not respond to the survey questionnaire.

SRS needs to obtain the most accurate data available because reported differences, either higher or lower, can result in a substantial difference in the amount of deficiency payments. For example, a 1-cent change in the average market price for wheat in 1981 would have caused about a \$28 million difference in deficiency payments. According to SRS' Director, Estimates Division, and Chief, Prices and Labor Branch, SRS does not have a quality measurement system for its prices received survey. Because the information is provided on a voluntary basis, SRS makes do with the information buyers give.

SRS ACCEPTS AND USES AVERAGE PRICES

Each month SRS mails questionnaires to a stratified random sample of grain buyers within each of the 20 States participating in the prices received survey for wheat. The quantity purchased from farmers and the total dollars paid for the previous month are collected and summarized by each of the 20 State statistical offices. The responses are weighted $\frac{1}{n}$ to develop statewide estimates and aggregated to arrive at a national weighted average market price. Buyer participation in the survey is voluntary. Data for nonresponding buyers is imputed from the information reported by buyers who respond, on the assumption that the respondents are representative of the nonrespondents.

Questionnaires are the primary means of collecting market price information from grain buyers. But State statistical office enumerators in the States we reviewed also obtain the information by telephone from buyers who do not respond to the questionnaires. The enumerators accepted "average" prices per

1/The method of weighting is carried out by taking the data provided by the buyer and multiplying it by the reciprocal of the buyer's probability of selection.

bushel when the buyers did not want to provide the total dollars paid or when total dollars paid information was not readily available.

SRS has defined good survey data as that which has both quantity purchased and total dollars paid. According to SRS' Chief, Prices and Labor Branch, no written procedures exist that allow the acceptance of average price data in lieu of total dollars paid. However, he believes that average prices are better than no information, especially since buyer participation is voluntary. Our review showed, however, that reported averages can be merely rough estimates and/or erroneous.

For example, one grain buyer told us that he gives the enumerator an average of the daily market prices for the month. Another buyer said he gives the market prices for the 15th day of the month or an average of some randomly selected daily market prices. These methods of estimating do not reflect the dollars paid for the wheat actually purchased.

In one of these cases, the grain buyer gave SRS an average price per bushel of \$3.76 for his September 1981 wheat purchases. The buyer stated that he does not complete the questionnaire. However, he receives a call from the enumerator each month and is asked for data on bushels purchased and what the average price paid was. The buyer's records, however, showed that if he had reported total dollars paid and total quantities purchased for the month his weighted average would have been \$3.69. His reported average was therefore an inaccurate estimate and overstated his market price by 7 cents. Such overstatements in market prices could cause deficiency payments to be too low, while understatements could increase deficiency payments.

Still another indication that reported averages may not be accurate is shown by the differences between the reported average wheat prices and the weighted average prices we computed from Texas buyers reporting good data in October 1981. Texas buyers identified as providing total dollars paid and total quantities purchased had weighted average prices ranging from \$3.57 to \$4.05 per bushel, a spread of 48 cents. The buyers reporting only averages, however, reported prices ranging from \$2.70 to \$4.31 per bushel, a much greater spread of \$1.61.

We analyzed the responses used by three States for the 1981 wheat market price and found that many reported only averages. Twenty-eight percent of the Kansas respondents reported only averages; North Dakota had 17 percent; and Texas had 23 percent.

While our review was limited to the three States, we believe the use of average price data detracts from the validity of the survey results because erroneous average estimates accepted from grain buyers result in overstatements or understatements in market prices, thereby affecting the deficiency payment rates and payments made to farmers.

GRAIN BUYERS PROVIDE
INACCURATE INFORMATION

The accuracy of the national average market price is extremely important because of the substantial difference it can cause in total deficiency payments made. Our review of the records of 10 selected grain buyers in Kansas, North Dakota, and Texas who provided data for the market price survey showed that in some cases data reported was inaccurate. Among the 10 buyers, 7 reported inaccurate price data to SRS and 3 reported correctly. Two of the other three buyers we visited did not provide grain price data and another would not allow us to review his records.

The inaccuracies in reporting were due in part to (1) SRS enumerators who may not have adequately explained the purpose of the survey and information needed and (2) SRS questionnaires that were ambiguous, inconsistent, and lacked specificity. SRS does not have a quality control system to detect the causes or extent of errors.

SRS procedures specify that an enumerator is to visit buyers the first month they are selected for the survey. The enumerator is to explain the questionnaire and survey and also collect the first month's data from the buyer's records. This is apparently not always being done.

We questioned 13 buyers in the three States to determine the extent of enumerators' visits; only 6 could remember being visited. SRS' Chief, Data Collection Branch, stated that enumerators are not making the first contact as frequently because buyers are now familiar with the survey. However, one of the buyers we visited did not know what the price survey is used for. This buyer was giving price estimates rather than reporting actual dollars paid.

We also reviewed the questionnaires each State used in the 1981 prices received survey because they are the primary means of collecting price data in the 20 participating States. Only 6 of the 20 State statistical offices mentioned in their questionnaires or cover letters that price information is used as the basis for calculating deficiency payments.

In addition, SRS' prices received survey requires that the total dollars paid include adjustments for discounts and premiums due to grading. None of the 20 questionnaires were specific about the inclusion of adjustments for discounts and premiums. For example, the Kansas questionnaire stated that:

"'Total dollars paid to farmers' during the month should include dollars paid to farmers as well as loan repayments."

Elsewhere on the same questionnaire the instructions for reporting dollars paid merely stated:

"Please report for the commodities listed below: total quantity purchased and total gross dollars paid to farmers (before any marketing deductions for storage, etc.) during the previous month."

Neither instruction explains in detail what are allowable adjustments for discounts and premiums. One of the buyers visited in Kansas told us that he did not include adjustments for discounts in the dollars reported because of the lack of specificity in the questionnaire's wording. The exclusion of discounts causes the market price to be overstated and lowers deficiency payments.

SRS also requires specific reporting times for contract sales. Forward price contracts (in which the price is determined at the time of sale and delivery is made at a later date) are to be reported for the month the grain is delivered. Delayed price contracts (in which the grain is delivered first and the price is determined when the farmer is ready to sell) are to be reported when the buyer pays for the grain. While many questionnaires explained the differences in these contract sales in detail and when to report them, 7 of the 20 questionnaires had confusing and ambiguous instructions. The Missouri questionnaire, for example, merely stated:

"Report contract sales for month of delivery.
Include amount paid at contract price."

This does not adequately explain that under delayed price contracts delivery takes place in advance of when price is settled and that quantities purchased and paid are to be reported when the buyer pays for the grain.

In another case, the Arizona questionnaire merely stated:

"Report contract purchases for month of delivery or when payment is made, not when contract is written."

If buyers with delayed price contracts reported the quantity delivered as instructed by the Arizona questionnaire, they would report the bushels purchased but would not know the dollars paid. The quantity purchased would, therefore, be overstated and would tend to lower the market price and increase deficiency payments.

The errors we found in the reported data from the seven buyers visited and their effect on the buyers' reported market price are shown in the following schedule.

<u>Buyer</u>	<u>Market price determined from reported data</u>	<u>Market price determined from buyer's records</u>	<u>Difference</u>	<u>Reason for errors</u>
Kansas:				
1	\$3.85	\$3.84	-\$0.01	(a)(b)
2	3.89	(c)	(c)	(a)(d)
3	3.89	(c)	(c)	(a)(d)
North Dakota:				
1	3.76	3.69	-0.07	(e)
Texas:				
1	3.58	3.55	-0.03	(f)
2	3.63	3.52	-0.11	(b)
3	3.54	3.63	+0.09	(b)

a/Buyer reported the gross contract rather than the net price paid to farmers after deducting discounts for grading. Failure to deduct discounts will cause the market price to be high and the resulting deficiency payment to be too low.

b/Buyer reported quantities and prices that did not agree with his records and that he could not explain.

c/Buyer said records were too voluminous to review. While we could not compute a corrected market price, we determined from a partial review of his records that he was reporting inaccurately for reasons noted in a and d.

d/Buyer included purchases from other buyers that normally receive a higher price and would cause deficiency payments to be too low.

e/Buyer provided a price estimate rather than total dollars paid for the wheat purchased.

f/Buyer excluded monthend purchases.

SRS State statisticians in all three States stated that since the information is provided on a voluntary basis, they accept what is reported unless obvious errors are apparent.

SRS LACKS A QUALITY REVIEW SYSTEM

SRS does not have a quality assurance procedure to measure the accuracy of data collected and correct reporting errors. Our inquiries at the three State offices visited indicated that the only attempt at quality assurance is an occasional check on obvious errors, such as a wheat price of \$5 when it is selling in the \$3 range.

In 1979 we proposed that the Secretary of Agriculture hire an independent statistical group to make an indepth evaluation

of the Department's statistical operations. 1/ Subsequently, SRS hired a team of independent statisticians to review its statistical procedures used in sampling, data collecting and processing, estimation, and publication in terms of current statistical theory in survey methodology. The statisticians recommended 2/ that a quality measurement system be started for the prices received survey.

According to SRS' Director, Estimates Division, and Chief, Prices and Labor Branch, SRS does not have a quality measurement system for this survey and makes do with the information buyers give because the survey information is given voluntarily. They did agree that SRS needs to know the extent of inaccuracies and will determine whether something can be done to improve the accuracy.

SURVEY NONRESPONSE RATES ARE HIGH

The 1981 national average market price for wheat was derived from the prices received survey for the 5-month period ended October 31, 1981. The survey's nonresponse rates varied among the 20 States and ranged from 0 to 48 percent. Overall, however, the survey's weighted nonresponse rate was 27 percent, which exceeded the 20-percent rate SRS officials said was their goal.

High nonresponse rates coupled with the use of average prices adversely affect the validity of the estimated market price and raise questions about the accuracy of the deficiency payments. Market prices obtained through the prices received survey from a sample of grain buyers are used to develop nationwide estimates. By accepting and using average prices, many of which are estimates, SRS decreases the accuracy of the national average market price. If SRS eliminated the use of reported averages, its nonresponse rate would be much higher. The following schedule shows the extent to which the nonresponse rate in the three States would be increased if SRS did not accept average prices.

1/"Agriculture's Statistics Agency--Computation of Average Market Price of Rice Questioned--Independent Evaluation and Unimpeded GAO Access to Records Needed," CED-79-85, June 25, 1979, pp. 25-27.

2/"Statistical Review of Survey Methodology and Estimation of the Statistics Unit of Economics, Statistics, Cooperatives Services," No. RTI/1849/00-00F.

<u>State</u>	<u>Nonresponse</u>	Nonresponse rate after excluding questionnaires with <u>average price data</u>
	----- (percent) -----	
Kansas	28.2	41.8
North Dakota	19.8	32.0
Texas	18.7	31.2
Weighted average	23.2	36.1

If SRS eliminated using average price data, however, the survey results would have been based on less data. We found that the dollars that were represented by the average price data and used in computing the national average market price represented a significant percent of total dollars reported. Forty-nine percent of the total dollars reported in 1981 for Texas was made up of average price data. Kansas had 39 percent and North Dakota had 22 percent. Our analysis of the 1981 national average market price showed that if the average price per bushel actually paid by nonrespondents differed by only 2.2 cents from the average price per bushel "imputed" for nonrespondents from the data reported by the respondents, the estimated overall average market price would vary by 1 cent. This in turn would have caused a difference of about \$28 million in 1981 deficiency payments. We believe SRS needs to improve its response rate along with the quality of data collected.

The independent statisticians' 1980 review recommended that SRS compile and analyze data on nonresponse rates and make personal visits to buyers to increase response in States having high nonresponse rates. SRS' Director, Estimates Division, and Chief, Prices and Labor Branch, told us that while they recognized the need to act on these recommendations, nothing was done. Funds for all data collection activity were reduced in both fiscal years 1981 and 1982.

The Department of Commerce's Office of Federal Statistical Policy and Standards ^{1/} published directives for conducting statistical activities. One directive requires that strenuous efforts be made to collect accurate data from all the buyers in the survey sample to improve accuracy--in this case, the

^{1/}By Executive Order No. 12318, effective Aug. 21, 1981, the office and its functions were transferred to the Office of Management and Budget.

accuracy of the national market price. One method suggested was to do a more intensive followup, such as telephone calls or personal visits. Enumerator followups should clearly and persuasively state the Government's need for the data and the benefits to farmers. We believe this should increase the response rate and improve the quality of the data for the prices received survey.

The Kansas SRS State statistician said that the 5-month period during which data is collected to compute the national average market price is the grain buyers' busiest season. Buyers are requested to return the questionnaire by the 15th of the month to report their previous month's purchases. While enumerators follow up with nonrespondents for the month the questionnaires are due, SRS had not considered retroactive reporting for previous months missed. Retroactive reporting would allow grain buyers more time to report accurate data and possibly improve SRS' response rate.

CONCLUSIONS

An accurate national market price is important, considering that a 1-cent variation in the estimated market price can affect the amount of deficiency payments by millions of dollars. The accuracy of the Department's national average market price, however, is questionable because of extensive problems in gathering prices paid data from grain buyers. For example:

- A substantial number of cases reported estimates of average prices paid, which can be erroneous, rather than actual bushels sold and dollars paid.
- Grain buyers do not report accurately even when they do not report average prices. Problems that may contribute to these reporting inaccuracies include unclear buyer survey instructions and limited buyer knowledge of the purpose and use of survey material.
- The Department has no quality assurance system to evaluate the accuracy of the grain purchase data obtained.
- Very high nonresponse rates, which would be even higher considering that average prices are used as acceptable data, detract from the validity of the market price.

RECOMMENDATION TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary direct the Administrator, SRS, to adopt procedures to improve the accuracy and validity of the national average market price by (1) avoiding the use of average prices in the prices received survey, (2) improving the accuracy of information collected, and (3) reducing nonresponse rates. Specifically, SRS should:

- Institute a system of quality control for the prices received survey as suggested by the 1980 statisticians report.
- Convey to enumerators the need for them to perform their job correctly and follow up to assure they do.
- Provide to each State a standard survey questionnaire with reporting instructions that eliminate possible reporting bias resulting from differing instructions and that clearly explain the purpose and importance of the survey.
- Institute a followup program to obtain missing reports of quantities sold and amounts paid from grain buyers who were unable to provide requested data during the reporting month. This would allow grain buyers more time to report accurate data and eliminate the need for using estimated average prices to compute the estimated average market price.

AGENCY COMMENTS AND OUR EVALUATION

The Department stated that our report is generally informative and points out several areas in which procedures need further refinement. The Department stated that it will implement many of the specific procedures recommended to improve the accuracy and validity of the national average market price. (See app. I.)

The Department stated that our expectations from a sample survey may be unrealistic because the survey is designed to yield price estimates with a coefficient of variation of 1 percent or less at the U.S. level. This means that the average price could be within 3 to 4 cents of the true value 66 percent of the time and within 6 to 8 cents 95 percent of the time. This is the error that could be expected from sampling alone and does not take into account nonsampling errors.

The Department stated that the issues we raised concerning the accuracy of the national average price are in the area of nonsampling errors. The magnitude of nonsampling errors identified is much less than expected sampling errors. SRS' goals are to minimize both sampling and nonsampling errors. Further, the Department stated that if accuracy of 1 cent or less is desired, a complete enumeration of all buyers will be required with attendant substantially higher dollar cost and respondent burden.

It is important to note that the errors we found are in addition to the expected sampling errors, and we still believe that a quality measurement system needs to be instituted because of the nonsampling errors found. Our review included data from only three States; therefore, we did not make projections on the nonsampling errors nationwide. We found, however, that using

erroneous reporting data caused a net 1-cent difference in the weighted average market price for these three States. We are not proposing that SRS design its sample survey to an accuracy of 1 cent or less; rather, SRS needs to ensure the accuracy and validity of the data it uses. As it stands, a 1-cent difference in the average market price computed would have made a \$28 million difference in wheat deficiency payments in 1981. A 1-cent difference could result from using invalid data.

The Department stated that for a large sample, errors in estimating average prices tend to be offsetting. The 1-cent difference cited in our report is a fraction of the expected sample error. It stated that a program measuring the extent of inaccuracies is desirable, but funding for such a system is a low priority. It stated also that increased sample size would increase accuracy significantly, and this would be a more prudent use of any additional funds. The Director of the SRS Estimates Division told us that a detailed estimate had not been made of the cost of instituting a quality measurement system.

We believe a quality measurement system would provide SRS with data on the magnitude of nonsampling errors nationwide and provide information on whether errors in a large sample are in fact offsetting. The 1-cent difference we cite is due to nonsampling errors, and while SRS may consider it a fraction of the expected sampling error, it is in addition to the expected sampling error. Increasing the sample size would not increase the accuracy of the market price if the data collected is invalid. We therefore disagree that it is more prudent to use additional funds to increase the sample size. Only by instituting a quality measurement program would SRS be in a position to determine if the effects of both the sampling error and nonsampling error are within an acceptable range.

CHAPTER 3

PROGRAM PRODUCTION IS OVERSTATED

AND PROGRAM YIELDS ARE INACCURATE

ASCS procedures used in computing deficiency payments result in overstating program production. In addition, its procedures in assigning yields do not adequately reflect crop yield variations within counties. We have two concerns with ASCS procedures.

- Deficiency payments made on planted acres intended for harvest without adjustments for unharvested acres result in overpayments. Based on information on the average yearly amount of land planted but not harvested during 1975 through 1981 for the Nation, we estimate that an overpayment of between \$15 million and \$43 million resulted in 1981.
- ASCS county committees assign most farm yields near the mean county yield. This raises a question of equitability because farms with high yields are assigned lower program yields while farms with low yields are assigned yields that are too high.

PROGRAM PRODUCTION IS OVERSTATED

The program yields ASCS established represent the number of bushels per acre each farm is determined capable of producing. The program yield multiplied by the planted acres certified by the farmer for program purposes establishes the farmer's program production on which deficiency payments will be paid.

ASCS uses SRS harvested yield data for States and counties to determine program yields. SRS gathers planted and harvested acreage and production statistics using farm surveys nationwide. SRS harvested acreage represents total acreage actually harvested while SRS planted acreage represents the total acreage planted. Planted acres by SRS' definition include land planted in wheat that the farmer may not intend to harvest because, for example, the farmer uses some of the planted acres for grazing. However, ASCS procedures specify for program purposes that farmers certify only planted acres intended for harvest.

Because differences exist in SRS harvested and planted acreage and acreage certified by farmers for payment, yields derived from dividing total production by these acreages also differ, with harvested acres producing the highest yields. ASCS program analysts told us that using SRS harvest yield data can result in assigning higher program yields than if they used SRS planted yield data. They stated, however, that of the two SRS yield figures, the harvest yield data is a closer estimate of yields for their purpose.

Because farmers are paid on acreage certified--that is, planted acres intended for harvest--unless an adjustment is made for unharvested acreage, production for program participants is overstated. The following table demonstrates the difference between SRS planted and harvested acreage compared with acreage certified for deficiency payments for 1975 through 1981. In 1981, for example, SRS planted and harvested acres totaled 88.8 and 80.7 million acres, respectively. Yields based on SRS harvested acres, however, are applied to ASCS-certified acres of 84.5 million, which differs from both SRS-reported acreages.

SRS Planted and Harvested Acres Compared With
ASCS Certified Acres, 1975 to 1981

<u>Year</u>	<u>SRS planted</u>	<u>SRS harvested</u>	<u>SRS not harvested</u>	<u>ASCS certified</u>
------(millions of acres)-----				
1981	88.8	80.7	8.1	<u>a/84.5</u>
1980	80.4	70.9	9.5	<u>b/75.0</u>
1979	71.4	62.5	8.9	(c)
1978	66.0	56.5	9.5	(c)
1977	75.4	66.7	8.7	(c)
1976	80.4	70.9	9.5	(c)
1975	74.9	69.5	5.4	(c)
Average	76.8	68.2	8.6	

a/This total represents about 96 percent of the total wheat acreage planted in 1981.

b/This total represents only 90 to 95 percent of the total acreage planted.

c/Reliable data not available.

An ASCS agricultural marketing specialist and SRS' Chief, Crops Branch, stated that it is difficult to reconcile the SRS and ASCS acreage differences because the data is collected differently. SRS data comes from a statistical survey and is available only for the State and county levels. ASCS data is provided by farmers participating in the deficiency payment program.

In addition, statistics that account for the difference in planted and harvested acreage are not available from either ASCS

or SRS. Some reasons were given, but how much of the difference each accounts for has not been measured. In addition to land planted with no intent to harvest because some of it might be used for grazing, other reasons for unharvested acreage include disaster caused by flooding, freezing, or drought. One ASCS program analyst said that roughly 3 million wheat acres are lost each year to disasters. Although an ASCS agricultural marketing specialist and SRS' Chief, Crops Branch, stressed the difficulty in reconciling the differences between SRS and ASCS acreages, they admitted no effort was actually made to do so.

The difference between the harvested acreage and acreage reported for payment will vary by county and farm. However, based on the average yearly amount of land planted but not harvested during 1975 through 1981, we estimated the range of overpayments that could have occurred in 1981 and 1982. For the low estimate we used the 3 million acres lost each year to disasters and for the high estimate we used the total amount of land planted but not harvested which, as shown on the previous page, averaged 8.6 million acres annually. We estimated that overpayments resulting from the use of unadjusted SRS harvested yield data in 1981 could have ranged from \$15 million to \$43 million. 1/ In addition, we estimate that in 1982 the overpayment may range from \$20 million to \$57 million. 2/

ASSIGNMENT OF INDIVIDUAL FARM YIELDS IS OFTEN INACCURATE

We found that program yields assigned to farms are grouped too closely around the mean county yields and do not properly account for yield variations within counties. Inaccurate payments may result because farmers with low yields would be assigned higher program yields than they normally achieve, while farmers with high yields would be assigned program yields that are too low.

State and national ASCS representatives said that they were aware that many county committees assign yields close to the mean county yield. Although they also said that some county committees

1/The low estimate for 1981 is computed based on 3 million acres times the ASCS program yield of 34.6 bushels an acre, times a reported 96-percent farmer participation rate, times a 15-cent-a-bushel deficiency payment. The high estimate is computed the same way using 8.6 million acres.

2/The low estimate for 1982 is computed based on 3 million acres times the ASCS estimated yield of 33.1 bushels an acre, times the 40-percent farmer participation rate, times a 50-cent-a-bushel deficiency payment. The high estimate is computed the same way using 8.6 million acres.

exhibit great reluctance to assign low yields, little has been done to identify what should be an appropriate yield distribution.

By assigning individual program yields too closely around the mean county yield, program effectiveness may be hurt in years when only a portion of farmers participate, such as crop year 1982 when farmers had to cut production to participate. Efforts to cut crop production will be hindered because high yielding farmers will tend to not enter the program and will not reduce their wheat production. On the other hand, low yielding farmers who are assigned overstated yields are not only more likely to participate, but their impact on cutting crop production will also be exaggerated.

ASCS procedures specify that county staff and committees assign yields to individual farms for program purposes; however, we found little guidance on how these yields are to be distributed among individual farms. The major restrictions are that the average yield for the entire county does not exceed a predetermined check figure and county committees are encouraged to have sufficient yield variation to reflect the full range of land and management practices in the county.

County committees now assign program yields to all farms that grew wheat for at least 1 out of the last 3 years. Nationally, about 1.1 million farms were assigned wheat yields for crop year 1981. Initial yields were assigned and then adjusted to agree with the predetermined countywide check figure. Current procedures allow farmers to appeal their assigned yields to the county committee, or they can prove higher yields by submitting evidence of actual production.

Wheat yield distribution

SRS and State affiliates publish annual wheat production and acreage statistics that are based on surveys of individual farm operators and estimates of a smaller number of farm yields collected by farm reporters. This data, when compared with the county ASCS distribution of yields, differed substantially.

We selected a 13-county area in south-central Kansas that ASCS officials said had similar growing characteristics to compare the distribution of yields, based on ASCS program yields and SRS-reported data. This area produced 84.6 million bushels of wheat, or 27.7 percent of total 1981 Kansas wheat production. We grouped the yield information for these 13 counties into five intervals of yield distribution. Our comparison, as shown in the following table, demonstrates that most of the 1982 ASCS program yields, 62.9 percent, are assigned within a 4-bushel range of the ASCS 31.3 mean yield for the area. SRS data for 1981, however, indicates only about 22 percent of the yields are within 4 bushels of the area mean and the yields are far more dispersed among the intervals.

Relative Frequency Distribution of Acres Classified by
Bushels per Acre--ASCS Program Yields Compared With
SRS-Reported Yields for 13 Selected Kansas Counties (note a)

<u>Bushels per acre</u>	<u>1981 ASCS- assigned program yields</u>	<u>1981 SRS production and acreage report</u>	<u>1981 SRS farm report</u>
	----- (percent) -----		
21 or less	.3	28.8	31.2
22 to 27	15.6	22.6	25.2
28 to 32	62.9	22.6	22.2
33 to 38	19.4	15.2	13.7
39 or more	<u>1.8</u>	<u>10.8</u>	<u>7.7</u>
 Total	 <u>100.0</u>	 <u>100.0</u>	 <u>100.0</u>
 Total sample size (farms)	 24,462	 539	 234

a/Percentage of farms. Counties selected by ASCS officials based on similarities of growing patterns.

When we analyzed the frequency distributions on bushels per acre of wheat assigned by ASCS in each of the 13 Kansas counties, we found that almost all were still closely clustered around the 31.3 mean county yield for the area. In contrast, the relative frequency distributions based on SRS-reported actual production showed very little clustering. The contrast between ASCS and SRS yield distributions is shown for the 13 counties in the following table. In Reno County, for example, 50.8 percent of the ASCS program yields clustered within a 4-bushel range of the mean for the area. In contrast, SRS yields were more dispersed. Only 31.1 percent of the yields were within the 4-bushel range. In addition, SRS data showed that 24.4 percent of the yields produced in Reno County were within 21 or less bushels an acre while ASCS showed none. Where SRS data showed 20 percent of the yields in Reno County exceeding 38 bushels an acre, ASCS showed only 3 percent.

Relative Frequency of Acres--1982 ASCS Program Yields
Compared With 1981 SRS-Reported Yields for
13 Selected Kansas Counties (note a)

County	Bushels per acre					Sample size (farms)
	21 or less	22 to 27	28 to 32	33 to 38	39 or more	
----- (percent) -----						
Barber-ASCS	.9	31.8	49.1	17.8	.4	748
SRS	45.9	18.9	16.2	18.9	0.0	37
Dickinson-ASCS	0.0	6.2	86.4	7.4	0.0	1,935
SRS	22.7	11.4	13.6	22.7	29.5	44
Ellsworth-ASCS	.1	19.8	62.3	17.4	.4	1,125
SRS	38.5	35.9	20.5	5.1	0.0	39
Harper-ASCS	0.0	.7	83.0	15.5	.9	1,362
SRS	19.5	22.0	36.6	17.1	4.9	41
Harvey-ASCS	.4	11.9	66.5	20.9	.4	1,620
SRS	34.1	36.4	11.4	11.4	6.8	44
Kingman-ASCS	2.8	39.4	32.1	19.9	5.7	1,570
SRS	23.7	26.3	23.7	13.2	13.2	38
McPherson-ASCS	.2	8.4	52.4	38.0	.9	2,640
SRS	24.6	28.1	22.8	14.0	10.5	57
Marion-ASCS	.1	16.7	82.6	.4	.2	2,181
SRS	44.1	8.8	35.3	8.8	2.9	34
Reno-ASCS	0.0	31.9	50.8	14.4	2.9	2,918
SRS	24.4	11.1	31.1	13.3	20.0	45
Rice-ASCS	0.0	1.2	65.2	33.0	.6	1,450
SRS	5.7	31.4	14.3	22.9	25.7	35
Saline-ASCS	.1	14.9	73.1	11.9	0.0	1,468
SRS	33.3	33.3	16.7	16.7	0.0	30
Sedgwick-ASCS	0.0	23.7	47.9	20.8	7.7	2,686
SRS	46.7	17.8	17.8	11.1	6.7	45
Sumner-ASCS	0.0	.3	71.5	28.2	0.0	2,759
SRS	16.0	16.0	32.0	22.0	14.0	50
Averages-ASCS	.3	15.5	62.9	19.4	1.8	
SRS	28.8	22.6	22.6	15.2	10.8	

a/Percent of acres. Counties selected by ASCS officials based on similarities of growing patterns.

An ASCS agricultural marketing specialist and program specialist told us that they were concerned about the process of assigning program yields to farms but have done little to identify the extent of the problem or to devise specific recommendations for what the yield distributions should be. An ASCS program specialist said that ASCS attempted to rectify the problem in 1980 when it issued instructions to its State and district directors to monitor program yield assignments more closely. He concluded that since we found the problems still existed, not enough had been done.

Our comparison, although limited to only 1 year of data and a 13-county area, indicates yields are very poorly distributed among the farms in each county. ASCS needs to conduct a comprehensive analysis to determine the full extent of the problem. The results from this analysis should provide the information needed by the counties to assign accurate program yields.

CONCLUSIONS

ASCS' use of prior years' harvested crop yields, without adjusting for planted but unharvested acreage, overstates program production. Our computations indicate that excessive deficiency payments between \$15 million and \$43 million occurred for the 1981 wheat crop. We estimate that in 1982 the overpayment will range from \$20 million to \$57 million. Unless the practice is corrected, excessive payments will continue.

Further, ASCS county committee assignments of program yields to individual farmers tend to be close to the average county yield. These assignments do not reflect the crop yield variation indicated by SRS yield information. The yield distributions also vary when compared among counties even though growing conditions are similar. Inaccurately assigned program yields may result in overpayments in those years where only a portion of the farmers enter the program. Farmers who are assigned program yields that are higher than their normal yields may enter the program and receive more than they are entitled to. Conversely, farmers assigned yields lower than their normal yields may not enter the program. Should the farmers with high-yield farms not enter acreage reduction programs, ASCS efforts to cut crop production will be hurt.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary direct the Administrator, ASCS to:

- Develop an acceptable adjustment for the deficiency payment program that properly accounts for the unharvested acreage on which payments are made.

- Conduct a comprehensive analysis of crop yield distributions to determine the extent to which program yields are inadequately assigned and develop crop yield frequency distributions for counties or similar areas to assist county committees in assigning yields to individual farms.

AGENCY COMMENTS AND OUR EVALUATION

The Department did not take a specific position on our recommendations. (See app. I.)

We proposed that an acceptable adjustment be made that properly accounts for the unharvested acreage difference between the prior year's harvested yield and the current year's program yield. The Department stated that using SRS yields per harvested acres does not result in overstated farm yields. We agree that the use of SRS harvested acreage is consistent with the way program yields have been established and have clarified our point in the final report and recommendation.

We still believe, however, that for the purpose of deficiency payments, multiplying program yields by acres certified--that is, planted acres intended for harvest--will result in overstating production and in overpayments unless certified and harvested acreages are the same. Because differences exist in SRS harvested and planted acreages and in acreage certified by farmers for payment, yields derived from dividing total production by these acreages also differ, with harvested acreages producing the highest yields. Therefore, unless an adjustment is made for the unharvested acreage on which deficiency payments are made, production for program participants is overstated and overpayments occur.

The Department stated that natural disaster is one of the major reasons that wheat acreage is not harvested. However, in most cases it is more economical for a producer to carry wheat on to harvest than to destroy the crop. Therefore, the greatest proportion of the wheat acreage that is disaster-affected is included in the SRS harvested acreage figure. The Department, however, did not have statistics to support its statement that most disaster acreage is carried on to harvest.

The Department also stated that rather than examine the use of harvested versus planted acreage yield data, we should have compared the program yield with the harvested and planted yield. It stated that for 1981, the national program yield was 34.6 bushels per acre, which was 0.1 bushel above the national harvested yield and 3.2 bushels above the national planted yield. The Department stated that it changed the method used to compute the program yield for the 1982 wheat crop and the program yield was lowered to a national average of 32.5 bushels per acre, 3.1 bushels below the national harvested yield and only 0.3 bushel above the national planted yield.

In 1980 and 1981, 2 of 4 years in which over 90 percent of the acreage planted was certified for the wheat program and during which the same computational method was used to derive the national program yield, the program yields were 33.7 and 34.6 bushels per acre, respectively. The national harvested yields for 1980 and 1981 were 33.4 and 34.5 bushels per acre, respectively. By multiplying the respective national program yields by harvested acres reported for the 2 years, program production is greater than actual production. While this adds more weight to our finding, this analysis alone is not conclusive because acreage data is collected differently by SRS and ASCS.

The change in method in 1982, which the Department states resulted in a national program yield of 32.5 bushels per acre, 3.1 bushels below the national harvested yield and only 0.3 bushels above the national planted yield, is within a closer range to reducing overstated program production based on 1 year's data. However, we believe that to assure that it is on target, ASCS should use additional years' data to compare the program yield with the harvested and planted yields and make appropriate adjustments for the deficiency payment program.

On our recommendation concerning crop yield distributions, the Department stated that the proper distribution of yields among farms in a county has been and remains a subject of concern. It stated, however, that our comparison between ASCS yield and a 1-year frequency distribution is misleading because ASCS yields reflect 5 or 10 years of actual yields that show a much smaller spread, since the extreme variations cancel out.

While ASCS yields reflect 5 or 10 years of actual data at the county level, this may not necessarily be the case at the individual farm level. Our comparison of ASCS and SRS data showed that county committees assign yields too closely around the mean county yield. Unless farmers prove their yields, their farm yields are derived from a predetermined check figure for the county. The county committee assigns yields to individual farms with one major restriction that requires that the average yield for the county not exceed the predetermined check figure. Each year the farmers' preliminary yield is their previous year's assigned yield. The county committee makes adjustments to these yields so that the total weighted yields for all farms will compute to the county average. Therefore, for the most part, unless farmers have proven their yields, their assigned yields may not necessarily reflect their actual yields.

The Department stated that as long as it does not have actual yield data on individual farms in the counties, it must rely on the judgment of the county committees to determine the relationship among farms. We agree that without information on actual yield data it is difficult for the national office to second-guess the county committees. For this reason, we believe that a comprehensive analysis needs to be done to determine what the proper yield distributions should be.

We recommended that USDA undertake a comprehensive analysis of crop yield distributions because we believe the results would provide information that not only would assist county committees in assigning equitable yields, but would provide management with a valuable tool to gauge the committees' efforts.

The Department stated that our report does not reflect a step that has been taken to correct problems. First in 1982 and more strongly in 1983, ASCS is requiring that the proven yield for a farm for 1 year be used as the preliminary yield for that farm for the next year. This requirement means that as producers prove their yields, the county committees will be forced to reduce the yields established for the farms that do not prove their yields. Thus, over the next few years, the yield distribution in a given county should become considerably wider.

We agree that this step will enhance ASCS' efforts to get actual yield data on farms. We believe, however, that it will be a lengthy process to achieve desired results. The percent of farms nationwide with established wheat yields that proved their yields in 1980 and 1981 were 2.2 percent and 1.3 percent, respectively. These percentages apply to over 900,000 wheat farms in 1980 and over 1 million wheat farms in 1981. In addition, the number of farms is not cumulative since farmers can prove their yields each year. Therefore, while this process may result eventually in widening yield distributions in counties, it appears that if ASCS relies solely on proven yields to correct the problems, it will be a lengthy process. By analyzing and developing crop yield frequency distributions, ASCS can speed the process to ensure that farmers are being assigned equitable yields.

CHAPTER 4

USDA's METHOD OF CALCULATING PROVEN YIELDS

FAILS TO ACCOUNT FOR ANNUAL CHANGES

IN YIELD AND ACREAGE PLANTED

If farmers believe their established program yields are too low, they are permitted to submit evidence proving actual production for previous years. For 1981 county ASCS offices were instructed to use a simple average of each farm's 1978, 1979, and 1980 actual crop yields when calculating proven yields. We believe, however, a weighted average is more equitable in representing proven yields because it properly accounts for year-to-year increases and decreases in acreage planted and yields.

The Department computes a simple average from each of the 3 year's average crop yield. Unless acreages remain constant, the Department's simple average method tends to overstate and understate yields depending on the direction in which acreages and yields increase and/or decrease. We calculated the 1981 proven yields for wheat in two counties (Reno County, Kansas, and Cass County, North Dakota) using weighted averages and compared them with the ASCS simple averages. In 41 percent of the ASCS proven yield cases, our computations produced different results. In 26 percent of the cases, yields computed by ASCS were greater, and in 15 percent of the cases they were smaller.

COMPARISON OF SIMPLE AND WEIGHTED AVERAGES

Our comparison of weighted averages with ASCS' simple averages for 1981 proven wheat yields showed differences for 17 of 48 cases in Reno County, Kansas. The simple average yields for 10 were overstated and 7 were understated. For Cass County, North Dakota, 13 of 26 proven yield cases differed. The yields for nine were overstated and four were understated. These overstatements and understatements of yields resulted because the simple average method does not account for changes in acreage and yield that occur from year to year.

For example, one farm in Cass County had the following 3-year wheat production for determining the 1981 proven yield.

<u>Year</u>	<u>Bushels produced</u>	<u>Acres planted</u>	<u>Yield per acre</u>
1978	2,459	50.0	49
1979	2,704	56.9	48
1980	<u>4,350</u>	<u>107.4</u>	41
Total	<u>9,513</u>	<u>214.3</u>	44

The simple average yield for 3 years is 46 bushels $[(49+48+41)\div 3]$; however, the weighted average is only 44 bushels [9,513 bushels \div 214.3 acres], a difference of 2 bushels an acre. The difference occurred because the simple average did not account for the nearly 100percent increase in acreage in 1980 that produced a lesser yield than 1978 and 1979. The farmer in this case received a 1981 wheat deficiency payment of \$737.55 based on his proven yield of 46 bushels an acre and 106.9 acres planted in 1981. If the farmer had been paid on the basis of a weighted average yield of 44 bushels per acre, he would have been paid \$31.95 less in deficiency payments.

In another case, a Reno County farm had the following 3-year production.

<u>Year</u>	<u>Bushels produced</u>	<u>Acres planted</u>	<u>Yield per acre</u>
1978	4,085	119.7	34
1979	5,280	122.0	43
1980	<u>7,298</u>	<u>146.4</u>	50
Total	<u>16,663</u>	<u>388.1</u>	43

The simple average yield for the 3 years is 42 bushels, but the weighted average is 43 bushels, an increase of 1 bushel an acre. The difference in this case resulted because the simple average did not account for the large increase in yield for 1980, which also had an increase in acreage planted. In this case, two farmers received a 1981 wheat deficiency payment totaling \$922.35 based on the proven yield of 42 bushels an acre and 146.4 acres planted in 1981. If the payment had been based on 43 bushels an acre, the farmers would have received \$21.90 more in deficiency payments.

Further analysis of the differences between using simple and weighted averages to calculate proven yields shows that both yield and acreage planted must change disproportionately to make a difference between the two methods. When yield decreases and acreage increases, or yield increases and acreage decreases, the simple average tends to be overstated. Conversely, when both yield and acreage increase, or both decrease, the simple average tends to be understated. The differences between simple and weighted averages can also vary due to rounding. For example, the simple average for one proven yield was 50.3 bushels an acre, which rounds to 50. The weighted average, however, was 50.6 bushels, which rounds to 51, an increase of 1 bushel an acre. The effects of rounding can work both ways.

The differences between the simple and weighted average methods in the two counties indicate the nationwide effect on 1981 wheat deficiency payments. The farmers for the 74 farms with proven yields were paid \$8,531 for proven yield increases; but, had a weighted average been used, a total payment difference of \$1,024 would have been made in the case of 30 producers. Thus,

some producers were overpaid \$777 and others underpaid \$247. This total payment is 12 percent of the amount paid to the farmers for their proven yield increases. If this same 12-percent rate applied to the approximate \$3 million national total of increased payments due to proven wheat yields, we estimate that a difference in payment of \$365,000 would have resulted; \$277,000 in overpayments and \$88,000 in underpayments, or a net of \$189,000 in excess Federal expenditures.

ASCS changes for 1982

ASCS changed its instructions for calculating proven yields for the 1982 crop year by requiring production evidence for the preceding 5 years rather than for only 3 years as required for the 1981 crop year. ASCS, however, still required a simple average to calculate the proven yield. Adding 2 more years of production evidence does not correct the problem of not properly accounting for year-to-year increases or decreases in acreage planted and yields. A weighted average is the only way to accurately account for these changes. An ASCS program specialist agreed that if acreage and yield fluctuated from year to year, computing a simple average over a 3- or 5-year period would create over- and/or understatements of proven yields. He stated, however, that data on yields for individual years would be lost by using the weighted average method.

CONCLUSION

ASCS uses a simple average instead of a weighted average to calculate proven yields based on several years' production evidence. The simple average method does not account for year-to-year changes in acreage planted and yield. In many cases, the simple average causes erroneous deficiency payments with some farmers overpaid and some underpaid and for the two counties visited resulted in the Federal Government making more outlays than warranted.

RECOMMENDATION TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary direct the Administrator, ASCS, to compute proven yields using weighted averages to properly account for year-to-year changes in yield and acreage planted.

AGENCY COMMENTS AND OUR EVALUATION

The Department stated that, in its opinion, the amount of the difference in payment shown by our review did not justify the extra administrative effort needed to compute and maintain proven yields using the weighted average formula. (See app. I.)

Department officials told us that a detailed cost analysis was not prepared to show what the extra administrative cost would be to use the weighted average method. They stated that because about 20 to 25 percent of the farms undergo changes in size and ownership each year, the administrative burden to maintain acreage and production histories on these reconstituted farms would be considerable. The Department officials, however, told us that the 20- to 25-percent figure was their estimate and that statistics to show the actual percentage were not available.

Because the weighted average computational method treats all farmers equitably and is more precise, we still believe USDA should adopt the weighted average method. We are not suggesting that production and acreage data be reconstituted for each previous year to account for the current year's acreage on which the farmer is proving his yield. We believe that the same information ASCS has available to compute the average yield each year can be used to compute the weighted average. In those years where the data on acreage and production is unavailable, as has been the case in some instances even for computing the simple average, an administrative decision should be made on the most cost-effective means of computing the proven yield. Further analysis is necessary to determine if changing the computational method to the weighted average requires more administrative effort.



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

DEC 18 1982

Mr. J. Dexter Peach
Director
Resources, Community and Economic
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General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Peach:

Thank you for the opportunity to respond to your report on wheat deficiency payments. The report is generally informative and points out several areas in which procedures need further refinement.

GAO indicates "the accuracy of the average market price is highly questionable." It is our position that GAO has unrealistic expectations from a sample survey. The sample survey is designed to yield price estimates with a coefficient of variation of 1 percent or less at the U.S. level. This means that a survey average price could be expected to be within 3-4 cents of the true value about 66 percent of the time and within 6-8 cents 95 percent of the time. This is the error that could be expected from sampling alone and does not take into account non-sampling errors. Issues raised in your report regarding the accuracy of the national average price are in the area of non-sampling errors. The magnitude of non-sampling errors identified by GAO is much less than expected sampling errors. SRS goals are to minimize both sampling and non-sampling errors. However, if accuracy of 1 cent or less is desired, a complete enumeration of all buyers will be required with attendant substantially higher dollar cost and respondent burden.

Our response to the specified recommendations made in your report are as follows:

SRS Accepts and Uses Average Prices--SRS agrees that efforts should be increased to reduce the number of average prices reported by respondents in lieu of quantities and associated dollars. At the same time, it must be remembered that data for the previous month are collected between the 13th and 17th of the following month. Consequently, in some cases, records simply may not be available. It is our belief that a knowledgeable person can closely estimate an average price if the price to be reported is carefully defined and that the error is less than that which would occur if the firm were omitted from the sample. Also for a large sample, errors in estimating average prices tend to be offsetting. The 1 cent difference cited by GAO is a fraction of the expected sample error.

Grain Buyers Provide Inaccurate Information--Response to the grain price questionnaire is voluntary and SRS does not have audit authority. Methods of marketing vary by area, firms do not have standardized bookkeeping systems and records may be part of a centralized recordkeeping system. For these reasons, questionnaire design and enumerator training is largely delegated to each State Statistical Office. The GAO findings do indicate a need for greater emphasis on standardization of questionnaires and training of enumerators.

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SRS Lacks a Quality Review System--SRS does not have a quality measurement system in which there is a formal independent re-enumeration and summarization to obtain quantitative measurement of the sources of error. A program measuring the extent of inaccuracies is desirable, but Agency funding is such that this has a low priority. Implementation of such a program within the current budget would require elimination of part of the on-going program. Furthermore, the expected improvement in accuracy resulting from a quality measurement program is small. Increased sample size would increase accuracy significantly, and this would be a more prudent use of any additional funds.

SRS does have a number of procedures to check quality of survey data. All data are run through computerized edit systems which identify errors or inconsistencies which are reviewed and resolved before data are summarized. Often, a firm is called to verify purchases that appear out of line with other firms or their past price level. Also, reported prices are compared with prices from other independent sources such as Grain Market News or local elevator quotes. Average prices are published by State as well as at the national level and are used by many in the grain trade. These data users are quick to question estimates they believe may not be correct.

Survey Non-response Rates Are High--GAO cites the Federal Statistical Policy and Standards directives and suggests that more intensive follow-ups with phone calls or personal visits be used to improve the quality of data for the prices received survey. SRS works within an unusually tight time frame with only 3 or 4 days available for follow-up. State Statistical Offices are expected to contact all non-respondents on each survey by phone or personal visit, but reduced resources have curtailed this follow-through.

Implementation of Recommendations to the Secretary of Agriculture:

1. A system of quality control will require additional funding not presently available.
2. SRS will intensify the training of enumerators to improve performance and better explain data needs to respondents.
3. Survey questionnaire format and reporting instructions will be reviewed and standardized.
4. A program to obtain missing reports for computation of the five-month average price will be implemented.

Using SRS Yields Per Harvested Acre Does Not Result in Overstated Farm Yields--This method is consistent with the way wheat yields have been determined in the past and the way cotton and rice yields are determined now. Since 1965, the statutes have defined the "projected county yield" and "projected farm yield" for wheat in terms of yields per harvested acre. These yields were used through 1977. The Food and Agriculture Act of 1977 provided that farm yields shall be the yield established for the farm for the previous year, adjusted to provide fair and equitable yield. This strongly implies a continuation of yields based on harvested acres. This is consistent with the statutory language on cotton and rice yields, which are determined based on the actual yields per harvested acre on the farm.

As noted in the report, there are two main reasons for the difference between planted and harvested acres of wheat. A large number of wheat acres are ultimately grazed out instead of harvested for grain. These acres have the same productive capability as other

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acres in the general area. The decision to graze or to harvest for grain a given acreage of wheat is normally based more on current market conditions than on the potential yield for the crop.

Aside from grazing, natural disaster is the other major reason that wheat acreage is not harvested. In most cases, however, it is more economical for a producer to carry wheat on to harvest than to destroy the crop. Therefore, the greatest proportion of the wheat acreage that is disaster-affected is included in the SRS harvested acreage figures.

Our farm yields are intended to reflect the productive capability of the farm assuming normal weather. For this reason, State check yields are computed using up to 10 years of data and, under one alternative, adjusted for abnormally low and high yields. Since we take these steps to eliminate the effects of adverse weather, it would be self-defeating to use yields per planted acre in establishing yields.

Finally, rather than just examining the use of harvested versus planted acres yield data, GAO should have compared the program yield with the harvested and planted yields. For 1981, the national program yield was 34.6 bushels per acre, which was .1 bushel above the national harvested yield and 3.2 bushels above the national planted yield. However, we changed the method used to compute the program yield for the 1982 wheat crop and the program yield was lowered to a national average of 32.5 bushels per acres, 3.1 bushels below the national harvested yield and only .3 bushel above the national planted yield.

Assignment of Individual Farm Yields is Often Inaccurate--The proper distribution of yields among farms in a county has been and remains a subject of concern. The data presented in the report on the Kansas counties seem to show that the ASCS yield spread is too narrow. However, the comparison between ASCS yields and a 1-year frequency distribution is misleading because ASCS yields reflect 5 or 10 years of actual yields which show a much smaller spread, since the extreme variations cancel out.

As long as we do not have actual yield data on individual farms in the counties, we must rely on the judgement of the county ASC committees to determine the relationship among farms. A frequency distribution that reflects 5 years of yields could be used as a yardstick by which to measure a committee's efforts.

Over the years the number of farms growing wheat in the area from Texas to North Dakota has decreased. We would expect that the decrease would have been in farms with the lowest yields as the poorest producers are going out of farming. The trend is towards more uniformity in farm management and yields will more and more reflect differences only in land capability.

At the national level, we do not have the knowledge of land capability in a given county nor do we have solid data on distribution of actual yields over several years. To the extent that anyone in ASCS knows this information, the county ASC committees know it best. Without this information, it is difficult for the national office to second-guess the county committee.

We should note a step that has been taken to correct problems which is not reflected in the report. First in 1982 and more strongly in 1983, we are requiring that the proven yield for a farm for one year be used as the preliminary yield for that farm for the next year. This requirement means that as producers prove their yields, the county ASC committee

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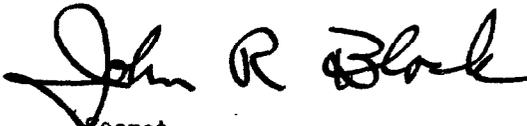
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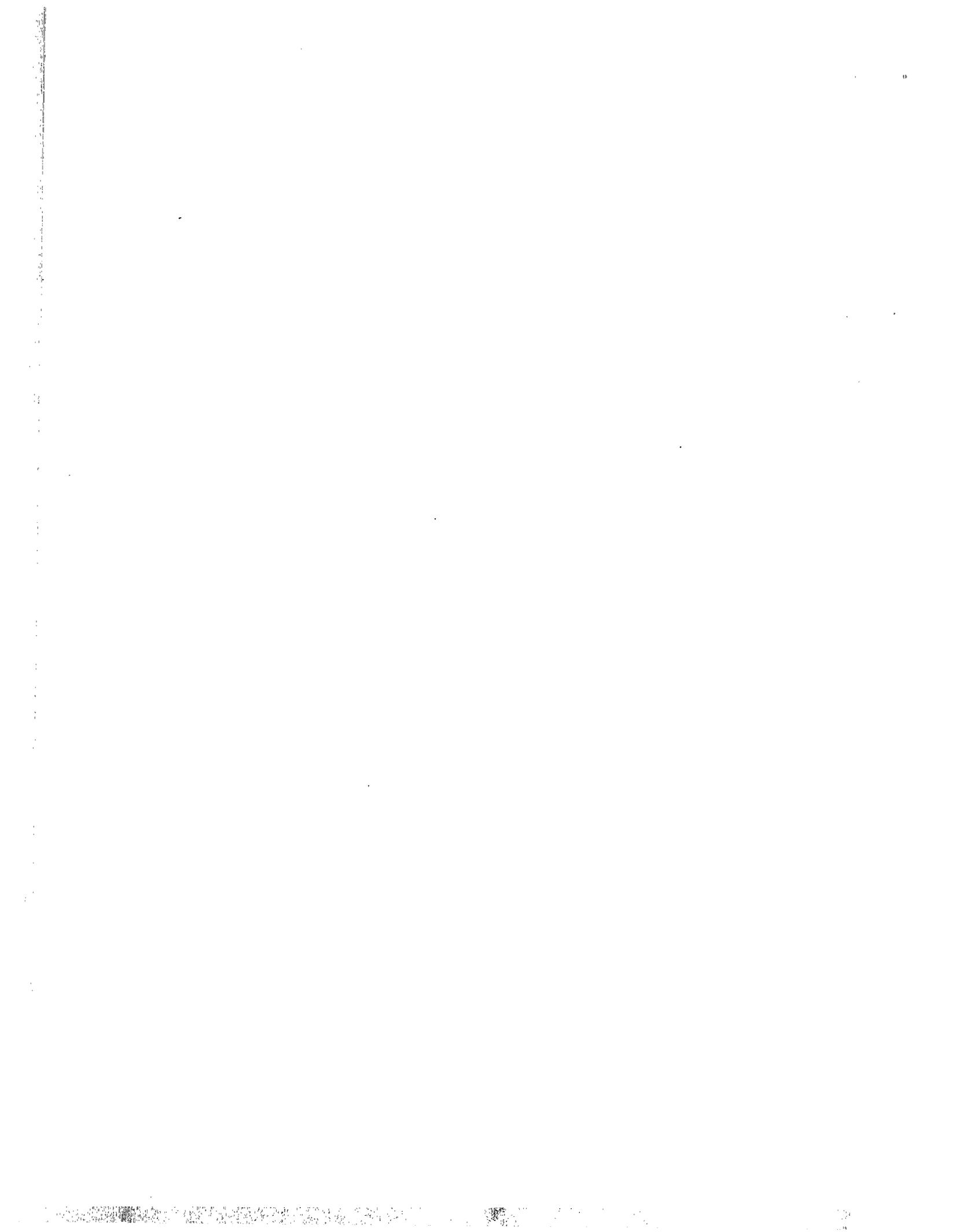
will be forced to reduce the yields established for the farms that do not prove their yields. Thus, over the next few years, the yield distribution in a given county should become considerably wider.

In our opinion, the amount of the differences in payment shown by your review does not justify the extra administrative effort needed to compute and maintain proven yields using the weighted average formula.

During the period reviewed, we did have provisions that required the county ASC committee to review cases where the current year acreage was less than 50 percent of the previous year's acreage and the actual yield exceeded 120 percent of the previous year's yield. This requirement was intended to prevent manipulation of the simple average procedure in order to achieve a higher yield. In an effort to simplify procedures, these provisions were removed for 1982. They will be reinstated for 1983.

Sincerely,


Secretary



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